

Claims

1. An uninterruptible power supply device for supplying electrical energy to one of
an array of loads having a broad range of power requirements, and for continuing to
5 supply electrical energy to the said one load for a limited period of time in the event of
failure of the said one load's main power supply, the uninterruptible power supply device
including:

at least one power means for providing electrical energy for the said one load; and
control means, connected to the or each power means and the load, for controlling
10 the device;

wherein:

the or each power means incorporates a plurality of electrical potential energy
storage units, each storage unit providing substantially the same electrical potential
energy as determined by a potential difference, or a voltage, across the electrical potential
15 energy storage unit; and

the control means is arranged to connect the electrical potential energy storage
units according to the power required by the load, the same power means being
employable for each one of the array of loads.

20 2. An uninterruptible power supply device according to any Claim 1, wherein the
electrical potential energy storage units within the or each power means are connected in
parallel by the control means, making the voltage across the or each power means
substantially the same as the voltage across the electrical potential energy storage units
incorporated within the or each power means.

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3. An uninterruptible power supply device according to Claim 1, wherein the
electrical potential energy storage units within the or each power means are connected in
series by the control means, making the voltage across the or each power means
substantially equal to the sum of the voltages across the electrical potential energy storage
30 units incorporated within the or each power means.

4. An uninterruptible power supply device according to any preceding claim, wherein a voltage across the control means is determined by the voltage across the or each power means and the uninterruptible power supply device is arranged to provide electrical energy to a different one of the array of loads by altering the voltage across the
5 control means.

5. An uninterruptible power supply device according to Claim 4, wherein the voltage across the control means is suitable for supplying electrical energy to a sub-set of the array of loads, each load within the sub-set having a power requirement up to the power
10 determined by the voltage across the control means.

6. An uninterruptible power supply device according to Claims 4 or 5, wherein the uninterruptible power supply device contains a plurality of power means, the voltage across each power means being substantially the same, and the control means connects
15 each one of the plurality of power means in parallel, making the voltage across the control means substantially the same as the voltage across each power means, thereby increasing the limited period of time for which the uninterruptible power supply device is able to supply the said one load in the event of failure of the said one load's main power supply.

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7. An uninterruptible power supply device according to Claims 4 or 5, wherein the uninterruptible power supply device contains a plurality of power means, the voltage across each power means being substantially the same, and the control means connects each one of the plurality of power means in series, making the voltage across the control
25 means substantially equal to the sum of the voltages across each power means.

8. An uninterruptible power supply device according to Claims 2 or 6, wherein the control means incorporates a single electrical potential energy storage unit, which the control means connects in parallel to the or each power means, making the voltage across
30 the control means substantially the same as the voltage across the single potential energy storage unit.

9. An uninterruptible power supply device according to any preceding claim, wherein any connection made by the control means between electrical potential energy storage units, or between power means, is made within the control means.
- 5 10. An uninterruptible power supply device according to any preceding claim, wherein the or each power means weighs 25 kg or less.
- 10 11. An uninterruptible power supply device according to any preceding claim, wherein the control means weighs 25 kg or less.
12. An uninterruptible power supply device according to any preceding claim, wherein the electrical potential energy storage units are battery packs.
- 15 13. An uninterruptible power supply device according to Claim 12, wherein each battery pack is comprised of four 12 V batteries which are connected in series.
14. An uninterruptible power supply device according to any preceding claim, further including at least one connecting cable for respectively connecting the control means to the or each power means, the or each connecting cable being connectable to the control means only in a preferred orientation.
- 20 15. An uninterruptible power supply device according to any preceding claim, wherein the control means is arranged to connect to a further power supply in the event of failure of the said one load's main power supply, such that the voltage across each potential energy storage unit remains substantially unchanged during normal operation of the uninterruptible power supply device.
- 25 16. An uninterruptible power supply device according to Claim 15, wherein the main power supply and the further power supply are separate single-phase electricity supplies from the mains supply.
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17. An uninterruptible power supply device according to any preceding claim, wherein the control means is provided with, and controls, an internal bypass switch which, when closed, causes the electrical energy as supplied by the load's main power supply to be provided directly to the load.

18. An uninterruptible power supply device according to Claim 17, wherein the internal bypass switch is also manually operable by an operator of the uninterruptible power supply device.

19. An uninterruptible power supply device according to Claim 18, wherein the uninterruptible power supply device is connectable to a bypass means, the bypass means being arranged to isolate the uninterruptible power supply device from the load after the internal bypass switch has been closed.

20. An uninterruptible power supply device according to any preceding claim, wherein the uninterruptible power supply device is configurable into one of two formats, namely a rack-mount format or a standalone format.

21. An uninterruptible power supply device according to any preceding claim, wherein the array of loads have power requirements ranging up to and including 6000 VA.

22. An uninterruptible power supply device according to any preceding claim, wherein the control means incorporates a display unit, housed within a receptacle, which is able to adopt a variety of positions within the receptacle.

23. An uninterruptible power supply device according to Claim 22, wherein the display unit incorporates a liquid crystal display screen.

24. An uninterruptible power supply device according to Claims 22 or 23, wherein the display unit takes substantially the shape of a cube which is readily removable from, and reinsertable into, the receptacle.

5 25. An uninterruptible power supply device according to any preceding claim, wherein:

the uninterruptible power supply device is configurable into both rack-mount and standalone formats and is formed from a plurality of modular units; and

10 the modular units are connectable together by bridging indentations of a first size which are formed between the modular units when positioned together in either rack-mount or standalone format.

26. An uninterruptible power supply device according to Claim 25, wherein two oppositely facing panels of each modular unit feature two oppositely facing indentations
15 of a second size at the top and bottom of the panel, the indentations of the second size being substantially half the size of the indentations of the first size.

27. An uninterruptible power supply device according to Claim 26, wherein the indentations of the second size are dual-purpose, being also suitable for use as a
20 receptacle for a foot support to stabilise a modular unit when used in the standalone format.

28. An uninterruptible power supply device for supplying electrical energy to a load, and for continuing to supply electrical energy to the load for a limited period of time in
25 the event of failure of the load's main power supply, the uninterruptible power supply device including:

at least one power means for providing electrical energy for the load; and

control means, connected to the power means and the load, for controlling the device;

30 wherein the control means is arranged to connect to a further power supply in the event of failure of the load's main power supply, such that the or each power means

remains substantially unchanged during normal operation of the uninterruptible power supply device.

29. An uninterruptible power supply device according to Claim 28, wherein the main
5 power supply and the further power supply are separate single-phase electricity supplies from the mains supply.

30. An uninterruptible power supply device for supplying electrical energy to a load,
and for continuing to supply electrical energy to the load for a limited period of time in
10 the event of failure of the load's main power supply, the uninterruptible power supply device including:

at least one power means for providing electrical energy for the load; and
control means, connected to the power means and the load, for controlling the
device;

15 wherein:

the control means is provided with, and controls, an internal bypass switch which,
when closed, causes the electrical energy as supplied by the load's main power supply to
be provided directly to the load;

the internal bypass switch is also manually operable by an operator of the
20 uninterruptible power supply device; and

the uninterruptible power supply device is connectable to a bypass means, the
bypass means being arranged to isolate the uninterruptible power supply device from the
load after the internal bypass switch has been closed.

25 31. An uninterruptible power supply device for supplying electrical energy to a load,
and for continuing to supply electrical energy to the load for a limited period of time in
the event of failure of the load's main power supply, the uninterruptible power supply
device including:

at least one power means for providing electrical energy for the load; and

30 control means, connected to the power means and the load, for controlling the
device;

wherein the control means incorporates a display unit, housed within a receptacle, which is able to adopt a variety of positions within the receptacle.

32. An uninterruptible power supply device according to Claim 31, wherein the
5 display unit incorporates a liquid crystal display screen.

33. An uninterruptible power supply device according to Claims 31 or 32, wherein the display unit takes substantially the shape of a cube which is readily removable from, and reinsertable into, the receptacle.

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34. An uninterruptible power supply device for supplying electrical energy to a load, and for continuing to supply electrical energy to the load for a limited period of time in the event of failure of the load's main power supply, wherein:

the uninterruptible power supply device is configurable into both rack-mount and
15 standalone formats and is formed from a plurality of modular units; and

the modular units are connectable together by bridging indentations of a first size which are formed between the modular units when positioned together in either rack-mount or standalone format.

20 35. An uninterruptible power supply device according to Claim 34, wherein two oppositely facing panels of each modular unit feature two oppositely facing indentations of a second size at the top and bottom of the panel, the indentations of the second size being substantially half the size of the indentations of the first size.

25 36. An uninterruptible power supply device according to Claim 35, wherein the indentations of the second size are dual-purpose, being also suitable for use as a receptacle for a foot support to stabilise a modular unit when used in the standalone format.

30 37. All methods of operating the uninterruptible power supply device, and or supplying electrical energy to at least one of an array of loads having a broad range of

power requirements, as disclosed in the specification and or described with reference to any of the Figures 1 to 10 of the accompanying drawings.